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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,191	01/20/2004	Kazumi Matsushige	2004-0076	7701

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EXAMINER

ABOAGYE, MICHAEL

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

8

Office Action Summary	Application No. 10/759,191	Applicant(s) MATSUSHIGE ET AL.	
	Examiner Michael Aboagye	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>06/14/04, 03/02/04, 01/20/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on June 11, 1999. It is noted, however, certified copy of the priority document has not been received.

Specification

2. The disclosure is objected to because of the following informalities: The status of the parent application serial No. 10/009,168 should be updated as US 6,702,175.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 21-27, 33, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Sekhar. (US Patent No. 5,094,700).

Sekhar discloses a joined object (column 1, lines 24 and 46) by soldering with a lead-free solder; wherein the lead-free solder is an alloy of tin (column 2, lines 30-36 and lines 60-65); wherein the lead free solder includes a metal (i.e. Indium or Bismuth) acting to decrease the melting point of the solder (column 1, lines 31-35); wherein the lead-free solder has a Sn-Ag based composition as a main ingredient (column 2, line

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30-35); wherein the melting point depressant is at least one of Bi, Cu, Zn and In (column 1, lines 31-35 and column 2, line 30-35); applying ultrasonic vibration to the solidifying or semi-solid lead-free solder thereby converting the coarse phases into fine and uniformly dispersed structures to enhance strength and wear resistance of the joint (abstract, column 1, line 66-column 2, line 8). Applicant is advised that the method limitations incorporated in these article claims do not impart any patentability.

5. Claims 21- 34, and 35-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Teshima et al. (US Patent No. 6,651,870).

Teshima et al. discloses a joined object (abstract, column 1, lines 15-20) by soldering with a lead-free solder which comprises an alloy of tin with no lead content (table 2, samples 1-6); applying ultrasonic vibration to at least an article or the member to be joined during soldering (column 7, lines 5-7) the joint has excellent joint strength (column 1, lines 43-49; column 7, lines 22-28 and column 24, lines 1-30); wherein the solder includes a metal (i.e. Indium or Bismuth) acting to decrease the melting point of the lead-free solder (column 8, lines 29-34); wherein the melting point decrease action metal is at least one of Bi, Cu, Zn and In (column 1, lines 65-67, and column 2, lines 1-18); wherein the article and the member contain Cu. Said Cu from the article and the member combining with Sn from the lead free solder to form Sn-Cu layer at the joint interface which intensifies the bond strength (column 1, lines 48-52).

Regarding claims 28-32, Teshima et al. teaches the layer of Sn-Cu, it is noted that this layer is characterized by a given thickness. Applicant is advised that the method limitations incorporated in these article claims do not impart any patentability.

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6. Claims 21- 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamaguchi et al. (US Patent No. 5,918,795).

Yamaguchi et al. discloses a joined object (electronic component)(column 1, lines 5-7) by soldering with a lead-free solder which comprises an alloy of tin (Abstract, column 1, lines 51-67); solidifying the lead free alloy by quenching and forming a finely dispersed structure which enhances the mechanical strength and the thermal fatigue strength of the joint (column 3, lines 1-6; column 2, lines 60-64; and column 5, lines 3-13). The lead free solder includes a metal (i.e. Indium and Bismuth) acting to decrease the melting point of the solder (column 2, lines 1-4); wherein the lead-free solder has a Sn-Ag based composition as a main ingredient (column 1, lines 60-65 and column 3, lines 66-67); wherein ^{AM}the melting the metal that decreases the melting point is at least one of Bi, Cu, Zn and In (column 1, lines 65-67, and column 2, lines 1-18); wherein at least the article and the member contain Cu. Said Cu from the article and the member combining with Sn from the lead free solder to form a Sn-Cu layer at the joint interface which intensifies the bond strength (column 2, lines 15-17).

Regarding claims 28-32, Yamaguchi et al. teaches the layer of Sn-Cu. It is noted that this layer is characterized by a given thickness.

Although ultrasonic vibration is not taught by Yamaguchi et al., applicant is advised that the method limitations incorporated in these article claims do not impart any patentability. It should also be noted that a joint with dispersed, non-segregated particles of high joint strength could be obtained by other methods.

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7. Claims 21, 33 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Sarkhel et al. (US Patent No. 5,730,932).

Sarkhel et al. discloses a joined object (electronic component, figure 2, "19") by soldering with a lead-free solder (abstract, column 2, lines 45-51); wherein the lead-free solder is an alloy of tin (column 1, lines 54-59); wherein the lead free solder includes a metal (i.e. Indium and Bismuth) acting to decrease the melting point of the solder (column 3, lines 32-45); wherein the lead-free solder has a Sn-Ag based composition as a main ingredient (column 3, lines 66-67); wherein the melting point depressant is at least one of Bi, Cu, Zn and In (column 3, lines 32-45); wherein the article and the member contain Cu (pad, copper foil) (column 1, lines 39-45, column 3, lines 54-57 and column 4, lines 55-59); wherein said lead free joint provides strong bond between said electronic components (column 2, lines 46-50).

Although ultrasonic vibration is not taught by Sarkhel et al., applicant is advised that the method limitations incorporated in these article claims do not impart any patentability. It should also be noted that a join with dispersed, non-segregated particles of high joint strength can be obtained by other methods.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. Miyake et al. (US 5,511,719) and Slattery et al. (US 5,256,370) are also cited in PTO-892.


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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Michael Aboagye
Assistant Examiner
Art unit 1725

10/29/2006

LYNNE R. EDMONDSON
PRIMARY EXAMINER

CK6
10/29/12